THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 40

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD D. LASKEN

Appeal No. 1997-0333
Application 08/521,162

ON BRIEF

Before BARRETT, GROSS and FRAHM, Administrative Patent Judges.

FRAHM, Administrative Patent Judge.

DECISION ON APPEAL

Appellant has appealed to the Board from the examiner's final rejection of claims 1 to 23, which constitute all of the pending claims in the application before us.

BACKGROUND

The subject matter on appeal is directed to a fault tolerant multi-drop communications system, and more specifically to such a system having plural communication nodes and a main control system wherein faulty nodes can be bypassed (see specification, page 1). As stated by appellant at page 1 of the specification, conventional systems either require delays in isolating and repairing faulty nodes, or they employ redundant bypass circuitry at each of the nodes. To overcome these problems in the prior art, the fault tolerant communications system of appellant's invention includes a parallel redundant path for communication between the nodes and a main control system and means for raising a voltage in order to blow a fuse of a node having a fault (see representative claim 1). As stated by appellant in the Summary of the Invention section of the specification, the invention of claims 1 to 23 on appeal provides improvements over prior art communications systems in that a node fault is detected while "communications is [sic] maintained between the main control system and the remaining nodes" (specification, page 2). Appellant accomplishes this by not using redundant hardware at the nodes, and by providing a main control system in communication with each node via a parallel redundant path. Thus, appellant has also provided an improvement in that "the communications system is of simplified structure and reduced cost" (specification, page 4).

Representative independent claim 1 is reproduced below:

1. A fault tolerant multi-drop communications system, comprising:

a plurality of communication nodes;

a parallel redundant path communicating with the nodes;

a main control system for the communication nodes;

means for disenabling, isolating, and sacrificing a node having a short circuit without redundancy or repair while maintaining communications between the main control system and the remaining nodes; and

means for raising a voltage to the nodes higher than normal such that the raised voltage blows a fuse of a node having a partial short.

The following reference is relied on by the examiner:

Hayes, John P. (Hayes), Computer Architecture and Organization (McGraw-Hill, second edition, 1988).

Claims 1 to 23 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hayes alone. We note that in the Answer the examiner has improperly referred to numerous prior Office actions (e.g., the final rejection in the instant application paper number 30), the final rejection in the parent application (paper number 20), and the final rejection in the grandparent application (paper number 6), which in turn improperly refer to other prior Office actions (e.g., paper number 30 refers to paper number 27 which refers to paper number 20, and paper number 6 refers to paper number 4). See MPEP § 1208 (Sixth Edition, Revision 1, September 1995) ("An examiner's

answer should not refer, either directly or indirectly, to more than one prior Office action."). We further note that the examiner improperly refers to paper number 7 in the Answer (see Answer, page 2), and our review of the file indicates that the examiner apparently intended to reference paper number 6.

Rather than repeat the positions of appellant and the examiner, reference is made to the Brief and the Answer for the respective details thereof.

OPINION

In reaching our conclusion on the issues raised in this appeal, we have carefully considered appellant's specification and claims, the applied reference to Hayes, and the respective viewpoints of appellant and the examiner found throughout the entire prosecution history. As a consequence of our review, we are in general agreement with appellant (Brief, pages 7 to 9) that the claims on appeal would not have been obvious to one of ordinary skill in the art at the time the invention was made in light of the teachings and reasonable suggestions of the applied reference. Because we conclude that the examiner has failed to make out a prima facie case of obviousness, and for the reasons which follow, we will not sustain the decision of the examiner rejecting claims 1 to 23 under 35 U.S.C. § 103.

Appellant argues (Brief, page 7) that Hayes does not teach a main control system as required by representative claim 1. The examiner admits (see final rejection of parent application, paper number 20, page 1) that Hayes fails to teach a main control system, and asserts that it would have been obvious to have one. We agree with appellant, and find that no main control system is taught or suggested by

Hayes. Our review of Hayes, including the processor ring structure of Hayes' Figure 7.55(c) on page 650 relied on by the examiner, fails to reveal a main control system. In fact, Hayes appears to indicate the contrary, that instead of a main control system, the processor ring structure itself serves to control operation of the communications system (i.e., each individual slave processor can serve as a master if called upon). We are not persuaded by the examiner's arguments that "there must be a main control" since "the reference fails to explicitly mention that it has a main control system" and since "the topology is meaningless in the absence of a controller" (final rejection of parent application, paper number 20, page 1). The examiner has not adequately shown that Hayes teaches or would suggest a main control system, nor has the examiner provided any plausible reason as to why the ordinarily skilled artisan would have added one.

Appellant correctly argues that "Hayes does not have a parallel redundant path" as required by representative claim 1 (see Brief, page 7). We find it significant that the examiner has failed to address this point of argument in the Answer. We agree with appellant that Hayes does not teach or suggest this feature, and find that the pairs of unidirectional (full duplex) lines of Hayes (page 650) fail to meet the function or the clear language of claim 1 of "a parallel redundant path communicating with the nodes" (claim 1 on appeal).

Appellant argues (Brief, page 7) that Hayes fails to meet the limitation of the claims of reconfiguring around a faulty node. The examiner (Answer, page 2) states that Hayes meets the

requirement of the claims since Hayes provides a dynamic redundancy option which reconfigures around a faulty node. We note at the outset that this limitation is set forth in means-plus-function language. We are in agreement with the examiner that this feature is met by Hayes as discussed below.

We agree with the examiner that the processor ring of Figure 7.55(c) (see Hayes, page 650) serves to reconfigure, and thus serves the same purpose as the "means for disenabling . . . " of appellant's claim 1. The reconfiguring in Hayes is an equivalent function to the recitation in claim 1 of isolating and disenabling of a faulty node while maintaining communication, to the extent that this feature is broadly set forth in the claim. Indeed, the entire purpose of Hayes' disclosed "fault-tolerant computer" is to "'...execute specified algorithms correctly regardless of hardware failures and program errors'" (Hayes, page 664). As stated by Hayes, "fault tolerance is a major design goal [in some applications]" (Hayes, page 664). As discussed in Hayes, "[a] system with *dynamic redundancy* tolerates faults by actively reorganizing the system so that the functions of the faulty unit are transferred to one or more fault-free units," such as by "logically reconfiguring the system around the fault" (Hayes, page 666). Accordingly, we find that Hayes teaches the feature recited in representative claim 1 of a "means for disenabling, isolating, and sacrificing a node having a short circuit without redundancy or repair." We find that the language "without redundancy or repair" is met by Hayes, since one option in

Figure 7.66 is not to repair or replace a node with a spare (redundancy) but to "reconfigure" around the faulty unit. As clearly stated by Hayes, a fault is removed by "repairing the faulty unit, replacing it by a spare unit, or logically reconfiguring the system around the fault" (Hayes, page 666)(emphasis added).

We agree with appellant (Brief, page 8) that Hayes does not meet the requirement of the claims of a "means for raising a voltage to the nodes higher than normal such that the raised voltage blows a fuse of a node having a partial short" (representative claim 1). The examiner's bald assertion that everyone knows how a fuse works is not dispositive of whether or not Hayes teaches or would have suggested the specific means recited or its equivalent. The examiner has not met his burden of showing where Hayes teaches or would have suggested using a fuse or a means for blowing a fuse. We can find no motivation for modifying Hayes to achieve the invention of claim 1 on appeal, requiring a means for raising a voltage to blow a fuse when a node has a partial short.

The examiner has failed to make a prima facie case that Hayes would have taught or suggested the main control system, parallel redundant communication path, or means for raising a voltage as claimed. The examiner has also failed to sufficiently explain how the applied reference to Hayes would be properly modified to meet this subject matter as recited in the claims on appeal. Although we do find that Hayes provides a means for maintaining communication after dealing with a faulty node, we find that the differences between the subject matter recited in the claims and in Hayes are such that the claimed subject matter as a whole would not have been obvious within the meaning of 35 U.S.C. §

103. Accordingly, we shall reverse the rejection of claims 1 to 23 on appeal.

CONCLUSION

The decision of the examiner rejecting claims 1 to 23 under 35 U.S.C. § 103 is reversed.

REVERSED

LEE E. BARRETT Administrative Patent Judge	)
	) BOARD OF PATENT
ANITA PELLMAN GROSS Administrative Patent Judge	) APPEALS AND
	) INTERFERENCES
ERIC FRAHM Administrative Patent Judge	)

EF/pgg
Patrick D. Ertel
6300 Sears Tower
233 South Wacker Drive
Chicago, IL 60606-6402